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■ Firms getting tough with automobile fluff

By Michael Marley

PHILADELPHIA, Aug. 2 -- "Plastics!" advised one of the characters in the 1960s film *The Graduate*. It was touted as the career of choice for the movie's hero, Benjamin Braddock (Dustin Hoffman). The recent college graduate repeats the word, but seemingly disregards the advice.

Unfortunately for the steel business, future automakers in the audience did not. Plastics have become an integral part of today's vehicles--several integral parts, for that matter--as corporate average fuel economy (CAFE) standards and other environmental issues play leading roles in promoting wider usage of plastics as alternatives to metals.

But another environmental issue has emerged, prompting automakers to revise their market scenarios. It is called the end-of-life vehicle law--or ELV--and it is making car companies think a little longer about what types of materials are left when their vehicles no longer are roadworthy.

Autos are perhaps the most recycled consumer products in use today. But while most eventually are shredded and recycled, some 20 to 25 percent of the materials in each vehicle is not (or cannot be) recaptured and reused. Materials left in the waste stream include plastics, glass, textiles and rubber. All become automotive shredder residue, or "fluff" as it is popularly called; a stew that was regarded simply as a waste by-product of auto shredding and dumped in a landfill.

Now, though, there are new demands that the fluff be reduced.

Some of those making the most noise want waste streams--all waste streams, not just shredder fluff--reduced. Others are concerned about dealing with toxic metals like cadmium and mercury. As a consequence, ELV laws have been adopted in Europe and Japan requiring that more of the vehicle be recycled and that fewer hazardous materials be left in the shredder residue.

No such end-of-life measures have been enacted in the United States. There are, however, similar concerns here, and some state laws have been enacted dealing with the disposal of certain toxic parts, like mercury switches, to augment underlying demands that less of everything be thrown into landfills.

How to deal with that issue? For the scrap industry, the answer was a call to automakers and other manufacturers to "Design for Recycling," a concept that the scrap industry even trademarked. Still, it has not found as many vocal advocates in the auto industry. One scrap executive in Detroit said that automakers were still designing for the showroom, not the shredder.

Ford Motor Co. boasts that it was the first company to issue worldwide automotive recycling guidelines to its suppliers and engineers. For every new product, Ford explained in a statement on its Web site, the automaker creates internal recyclability and recovery goals, as well as objectives for the use of recycled materials. Its goals are two-fold: maximize the use of materials recovered and minimize the amount of waste coming from end-of-life vehicles.

Both here and in Europe, Ford has formed recycling action teams whose jobs are to find new uses for old materials. Ford even has developed some components from curbside recycling: grille opening reinforcements made in part from plastic soft-drink bottles, and painted grilles on vans and pickups fashioned from old computer housings and telephones.

In Europe, meanwhile, virgin materials have been replaced with new grades which contain a recycled-material content of 25 percent. At its Charleville plant in northern France, 2,000 tons of soft-drink bottle tops are used to make heating and air-conditioning components, while in England discarded telephone

and business machine housings are turned into instrument clusters.

Ford also has earned honors as the first automaker to recycle plastic bumpers salvaged from previous models to mold new taillight housings, guide brackets and bumper reinforcements.

General Motors Corp. also is designing for recycling and so is DaimlerChrysler Corp., but each seems to takes a different tack.

For the better part of the past decade, GM has been putting engineering standards into place aimed at improving the recyclability of its cars and trucks, according to Terry Cullum, the big automaker's director of environment and energy. These standards are given to all GM designers in the United States and overseas, as well as to its suppliers.

"To give you an example," he said, "we have come up with an approach that narrows down the number of opportunities for our design engineers to use for a door trim panel . . . moving them away from the multi-material adhesively bonded choices to a single-material, non-adhesive bonded.

"All auto companies have also adopted standards for what are called Substances of Concern (SOC)--the metals and materials that are raising questions these days," Cullum said. "The obvious ones are mercury, hexavalent chromium, lead, cadmium and all the CFCs (chlorofluorocarbons). It is a really long list of materials, but we have (both) restricted materials and reportable materials on those lists. Restricted means we can't use them at all. Reportable means we review prior to use."

"Reportable items" are metals and other materials that GM wants to avoid. These aren't end-of-life or regulatory issues at the moment, but the auto company realizes that, based on its own technical evaluation, they are likely to cause problems. Also, Cullum noted, many of them are showing up on other industry and environmental lists of material concerns.

Cullum said that GM did not like the idea of imposing a ban on specific metals or materials. "We don't like a ban on materials because you eliminate the potential use of the technology that may be created," he said.

Navigational displays in some GM cars use a small amount of mercury, but GM designers believe it provides benefits to drivers. Some interior lighting also has a small amount of mercury, but the automaker believes it is worth using, particularly for older drivers who may need more lighting. "Properly managed, we can use these materials provided they are removed from the vehicle when it reaches the end of its life. So they really are designed for the end of life of the vehicles," he said. "We feel that if you completely ban something, you eliminate the technology.

"One of the keys to promoting recycling was the Vehicle Recycling Partnership (VRP), an organization whose membership included the car companies, their suppliers, the auto dismantlers and scrap processors. The VRP still exists and information is still exchanged," Cullum said. What's gone is the Vehicle Recycling Development Center, where the actual research was done, which closed after it had processed well over 1,000 vehicles.

Automakers always have received a lot of anecdotal information from dismantlers, solicited or not, about the difficulties of recycling vehicles and parts and preparing them for the shredder. Fluid removal was a big issue for dismantlers, who complained that they could not get all of it out and they could not get it out quickly enough. So the VRP developed low-cost equipment that could get fluids out quicker and get the cars through recycling bays faster.

The VRP closed the development center, Cullum said, because it learned what it could from that work. "But," he added, "we still have the partnership and we are still doing research on shredder residue and what to do with it. One example of this is the work being done on instrument panels in junked cars, trying to

determine how to separate all the different materials in an instrument panel." The initial work on this was done in the United States, he said, but GM has just signed a contract to work with Salyp NV, Ypres, Belgium, to do the shredder residue analysis.

For DaimlerChrysler, recycling destined-for-the-dump materials is being done as part of its Care Car project, the second phase of which was unveiled earlier this year. Its stated goal is to increase the recyclability of automobiles to about 95 percent by weight and to increase the use of recycled materials in production vehicles.

In the program, Chrysler worked with 26 of its suppliers and Salt Lake City-based Recovery Plastics International to retrofit two Jeep Grand Cherokees with 54 plastic parts made from materials drawn from the auto shredder residue stream, then separated using RPI's proprietary plastic flotation technology. All of the made-from-recyclate parts met the auto company's material specifications.

"What we were doing was showcasing the fact that it is possible to get the same part and that we could get it at a lower cost," said Gerald Winslow, Care Car project manager. Chrysler opted for this route, he said, because it did not require the company to implement a design-for-recycling program. Instead, he explained, the technology could take care of the recycling stream.

Materials recovered from the fluff included polypropylene, ABS (acrylonitrile-butadiene-styrene) and polyurethane, three of the most commonly used plastics in automobiles. Once the material is recovered, some can be reused as it stands. Some, however, must be blended with virgin materials to meet the automaker's specifications.

Currently, DaimlerChrysler is operating a Salt Lake City pilot plant with RPI that can handle about 1,000 pounds of shredder residue a day. But Winslow said he hoped to see the project reach a commercial-scale operation in three to five years. To accomplish that, the automaker will have to work with its suppliers to build a supply infrastructure that will use the recovered materials. Then, some 18 to 24 months afterwards, a full-scale operation may be viable. Initially, the company probably will use the made-from-recycled parts in some limited production cars.

The project also included two scrap processors, the David J. Joseph Co. in Cincinnati and Hugo Neu Corp., New York. Both companies have since left the project, Winslow said, and Chrysler and RPI are now looking for other participants from the scrap industry willing to build the stand-alone plant to process shredder residues and recover plastics.

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